

**STANDARDS PRESENTATION  
TO  
CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH STANDARDS BOARD**

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TITLE 8, DIVISION 1, CHAPTER 4

TITLE 8: Division 1, Chapter 4, Subchapter 4. Construction Safety Orders  
Article 12. Pile Driving and Pile Extraction

*[Notes in italics are editorial notes and generally refer to A10.19 section number]*

§1600.1. Pile Driving.

(a) Site-Specific Safety Plan. *[similar to 4.1]*

(1) Prior to initiating pile driving or extraction operations, the pile contractor shall develop a written site-specific safety plan. The site-specific safety plan shall include, but not be limited to, the following:

(A) An outline of the steps for the intended operations.

(B) A list of the potential hazards associated with those operations and the procedures to minimize or eliminate employee exposure to those hazards.

(C) The location of utilities (both above and below grade) and procedures for work in their proximity.

(D) Means and methods to provide safe access, handling, storage and setup of piles and equipment.

(E) Special job procedures such as blasting operations, shoring, sloping and benching requirements, traffic control, confined space operations, and work over water.

(F) Emergency response procedures.

(2) Any changes to the site-specific safety plan shall be approved by a competent person, and the identity of the competent person shall be documented.

(A) Changes in the site-specific safety plan shall be communicated to all persons involved in or exposed to the operations.

(B) A copy of the site-specific safety plan with all approved changes shall be available on-site and shall be provided to the Division upon request.

(b) ~~(a)~~ Controlled Access and Danger Zones.

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(1) The employer shall establish a controlled access zone around the installation, driving, hoisting and/or extraction areas to prevent access by persons not directly involved in such operations. [4.7]

(2) The employer ~~A danger zone~~ shall ~~be~~ clearly delineated a danger zone around the operating hammer where employees involved in cutting, chipping or welding operations shall be prohibited so as to protect them from the hazards of falling objects.

~~(1) The employer shall establish the danger zone.~~

(3) (2) The controlled access and danger zones shall be maintained under the supervision of a competent person.

(c) (b) A blocking device capable of safely supporting the weight of the hammer shall be provided for placement in the leads under the hammer and used at all times while employees are working under the hammer. [1926.603(a)(5)]

~~Exception: Where it is necessary for a worker, momentarily, to lean through the leads to spot a pile under hammer, it is not required that the hammer be secured in the leads. [This exception is not permitted by fed OSHA]~~

(d) (e) Pressurized Lines and Hoses. Steam and air hammer hose connections.

(1) All pile driver hose connections including those to pile driver hammers, pile ejectors, or jet pipes shall be securely tethered with an adequate length of at least 1/4 inch (0.635 cm) alloy steel chain having 3,250 pounds (1,500 kg) rated capacity (working load limit), or equivalent strength alloy steel cable to prevent the line from thrashing around in case the coupling becomes disconnected. [similar to 1926.603(a)(9) & (10) and A10.19 sec 10.1]

(A) (2) Chains or wire rope shall not be shortened with knots, bolts or other makeshift devices. [10.2]

(2) Steam and compressed air line controls shall consist of two shutoff valves. At least one shutoff valve shall be equipped with a quick-acting lever within easy reach of the pile hammer

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operator. [10.5] *[relocated from 1600(s)]*

(e) ~~(d)~~ When used, platforms shall be of sufficient size so that the employee can easily avoid contact with the hammer. It shall be surrounded on all sides, except between the hammer leads, with a railing or guard line 42 to 45 inches in height. Guard lines shall be taut and at least 3/8 inch wire rope or equivalent. If railings are used, they shall be constructed in accordance with Section 1620. [14.2]

Exception: Pipe or structural steel railings of equivalent strength may be used.

(f) ~~(e)~~ Precautions shall be taken to ensure that objects are secured against wind and accidental displacement, to prevent tools, material, and equipment from falling off elevated platforms. Toeboards shall be installed on all sides of the platform in accordance with Section 1621(b).

(g) ~~(f)~~ Access to Pile Leads. [1926.603(a)(8) and 14.0]

(1) Leads shall be provided with a ladder or horizontal bracing that is uniformly spaced at intervals no greater than 18 inches, or the leads shall be equipped with ~~and~~ adequate anchorage rings, or similar attachment points, so that the employee may engage a personal fall protection system to the leads. The personal fall protection system shall comply with the requirements of Article 24.

(2) The means of access shall prevent the employee from contacting the pile hammer.

(3) The operator of the equipment will apply all brakes and necessary safety switches to prevent uncontrolled motion of the equipment before an employee may access the leads. [11.12]

(h) Sheet pile access. [16.0]

(1) ~~(g) Stirrups shall be provided for use on sheet piles or a mechanical device shall be used to guide the pile into place.~~ If an employee is required to go aloft on sheet piling, the employee shall use an aerial device or ladder. [16.1]

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~~Exception: Where it is unsafe to use an aerial device or ladder, boatswain's chair may be used in accordance with Section 1662. [Not found in federal pile driving standard]~~

~~(A) (h) Employee(s) shall not ride the hammer, crane load block or overhaul ball.~~

~~(B) A crane suspended personnel platform may be used for access if used in accordance with Section 5004.~~

~~(2) Sheet piling shall be firmly stabilized before workers are permitted to work on them.~~

~~(3) Stirrups shall be provided for use by employees who must take a position on sheet piles.~~

~~[16.2]~~

(i) Specific Pile Driving Requirements.

~~Where work is to be performed, walkways at least 20 inches in width shall be provided across piles or other open work with the exception of those piles on which the driver is standing. [This is covered by CSO Articles 17 and 24. Not found in federal pile driving standard.]~~

~~(1) Before any type of pile is placed in position for driving, the pile head must be cut square to the driving head and free of concrete spall, steel fragments, or other debris. [11.6]~~

~~(2) (f) Where a drop hammer is used for driving piling other than sheet piling, a driving head or bonnet shall be provided to bell the head of the pile and hold it true in the leads. [11.24]~~

(j) Pile Hammer Requirements.

(1) General.

~~(A) The pile hammer, clamp, power unit and supply hoses shall be inspected in accordance with their manufacturer's recommendations. Associated equipment such as the couplings, support and lifting equipment, rigging and retaining bolts shall be inspected before each shift and periodically during use. [12.1.1, 12.2.1, 12.3.1, etc]~~

~~(B) Driving heads shall be kept aligned with the pile and pile hammer as a pile is driven.~~

~~[12.2.4, 12.3.4, 12.4.4, etc]~~

(2) Vibratory pile hammers.

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(A) When driving with a crane-suspended vibratory pile hammer, the person operating the remote on/off clamp switch shall be in direct visual contact with the signal person. [11.26]

(B) The exciter (vibratory pile hammer) shall not be unclamped from the pile when there is any line pull on the suspension or when the pile hammer is still vibrating. [11.28, 12.1.5]

(k) Ring buoys shall be provided in accordance with Article 13 and located where readily available at intervals not exceeding 200 feet on all structures over water under the course of construction.

Where employees are concentrated in groups, there shall be additional ring buoys consisting of not less than 1 additional buoy for each 25 employees in that area. Portable standards or equivalent means to hold the ring buoys in plain view shall be provided. Life saving boats shall be provided in accordance with Article 13.

(l) All floating rigs, with the exception of small work rafts or pontoons, shall be equipped with at least 2 ring buoys.

(m) In every crew there shall be a designated signaler, and the engine or winch operator shall receive signals from no other except, that when an employee is aloft, the hammer shall not be moved except on the signal of the employee aloft. [11.9]

Note: For recommended standard hand signals, see Plate C-11.

(n) All deck engines, not operated by an operator on the throttle sides, shall be equipped with a cross extension of the throttle that is within the reach of the spool tender.

(o) Hoist Drums.

(1) Every hoisting drum ~~used~~ on a pile driver that uses a ~~pawl dog~~ and ratchet arrangement to hold it in position shall be equipped with an ~~adequate dog~~ effective pawl and ratchet capable of

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holding the rated load capacity when it is suspended. [19.3 clarified]

(2) This ~~pawl dog~~ shall be readily visible from the engine operator's station or shall be provided with a directly connected and positive telltale device that will be visible. [19.3]

(3) ~~(p) No arrangement of counterweights or springs on the dog shall be permitted which will allow the dog to be automatically disengaged~~ Pawls which automatically disengage either by relieving the load or rotating the drum are prohibited. [19.4] [clarifications initiated by DOSH & supplemented by staff]

(p) Pile Leads.

(1) ~~(p)~~ Stop blocks shall be provided for the leads to prevent the hammer from being raised against the head block. [13.3]

(2) Guards or devices shall be provided across the top of the head block to prevent the cable from jumping out of the sheaves. [1926.603(a)(6) and 13.5]

(3) ~~(p)~~ When the leads must be inclined in the driving of batter piles, provisions shall be made to stabilize the leads. [11.30] Pile gates shall be of a size sufficient to secure piling at the bottom of the leads during driving operations. At no time is an employee to open the gates while a pile hammer is driving a pile. [13.6]

~~(s) Steam line controls shall consist of two shutoff valves, one of which shall be a quick acting lever type within easy reach of the hammer operator.~~ [relocated to 1600.1(d)(2)]

(q) Pile Driving Rig Stability.

(1) ~~(p)~~ Guys, outriggers, thrustouts, or counter-balances shall be provided as necessary to maintain stability of pile driver rigs. [11.31]

(2) ~~(p)~~ Hammers shall be lowered to the bottom of the leads while the pile driver is being moved. [11.25] [Relocated from 1600(z)]

(3) ~~(p)~~ All employees shall be kept clear when piling is being hoisted into the leads. [11.19]

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(r) ~~(v)~~ When steel tube piles are being “blown out,” employees shall be kept well beyond the range of falling materials. *[11.20]*

(s) ~~(w)~~ When driving jacked piles, all access pits shall be provided with ladders and bulkheaded curbs to prevent material from falling into the pit. *[1926.603(c)(6)]*

Note: Section 5158 of the General Industry Safety Orders prescribes the minimum standards for preventing employee exposure to dangerous air contamination and/or oxygen deficiency in confined spaces.

(t) ~~(x)~~ Hoisting of piling shall be done by hooks provided with a means to prevent accidental disengagement or a shackle shall be used in place of a hook. *[sim. 11.22]*

(u) ~~(y)~~ Taglines shall be used for controlling unguided piles and free hanging (flying) hammers. *[11.23]*

~~(z) Hammers shall be lowered to the bottom of the leads while the pile driver is being moved.~~  
*[Relocated to 1600.1(q)(2)]*

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.

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§1600.2 Pile Extraction. [21.0]

(a) At no time shall the operator of the crane cause the load to bounce. [21.2]

(b) The crane shall have a lifting capacity of at least five times the weight of the pile hammer and pile. [21.2, 21.3]

(c) The rated capacity of the hammer's suspension shall not be exceeded. The manufacturer's recommendations for extracting piling shall be observed at all times. [21.2, 21.3]

(d) When piles are extracted by drop impact, the connection between the pile hammer and the piling shall be sound and shall be inspected often during the extraction process. [21.3]

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.



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§1601. Methods of Unloading and Storing Piles.

(a) Piles shall be unloaded in a controlled manner so that employees are not exposed to the hazard of rolling or falling piles.

(b) Piles shall be stored with support and/or bracing to prevent unintended movement. [7.0]

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code.